

Kentucky Methamphetamine Lab Decontamination Guidance For Inhabitable Properties

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**Environmental & Public Protection Cabinet
Department for Environmental Protection
Division of Waste Management**



To Protect and Enhance Kentucky's Environment



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This guidance is based on many other states' intensive studies, technical guidance documents and past experiences with clandestine drug lab cleanups over the last several years including the states of Minnesota, Tennessee, North Carolina, Colorado, Washington, Missouri and Indiana. The Kentucky Environmental & Public Protection (EPPC) would like to extend a special note of appreciation to the Minnesota Department of Health (MDH) and Minnesota Pollution Control Agency (MPCA) for their excellent guidance document entitled *Clandestine Drug Lab General Cleanup Guidance, April, 2007*, which provided the basis for this document, and to the States of Tennessee and Colorado for sharing their valuable experiences and wealth of knowledge into the methamphetamine (meth) cleanup process.

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NOTE

Missouri and Washington were the first states to develop meth lab cleanup guidance in the country in the mid 1990s. Since that time, as the meth lab problem has dramatically increased and spread across the country, numerous states have followed with adaptations of these first documents, making revisions based on their respective states' regulations, and also based on the most current understanding of meth lab cleanup. Neither this nor any other guidance provides science-based advice for removal of **all** potential risk to human health. This document does provide current information on methods for reducing exposures to toxic chemicals used in meth manufacture based on a number of studies and experience by other states on meth lab cleanup. The guidance will be revised as research and practice reveal a better understanding of meth chemicals, testing and decontamination.

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I. INTRODUCTION

This document is designed to assist property owners, certified meth cleanup contractors, and state and local authorities with their efforts to reduce exposure to contamination from former drug labs in **inhabitable properties** as defined in KRS 224.01-410. The guidance is based on current information on meth lab contamination and cleanup, and has been compiled and assimilated from other states' regulations and guidance documents, and input from professionals inside and outside of Kentucky who have experience in the field of clandestine drug lab decontamination.

Although meth is not the only drug manufactured in clandestine labs, meth labs are the most common and will be the focus of this document. Contractors working on decontamination of non-meth drug labs may contact the Kentucky Division of Waste Management (KDWM) at (502) 564-6716 for advice on decontamination of those labs.

Meth lab "cleanup" generally consists of two specific phases of work which can be termed **removal** and **decontamination**. **Removal** occurs when a meth lab is identified and seized by the Kentucky State Police (KSP) or local law enforcement, and bulk chemicals, containers, equipment and wastes used in the meth "cooking" process are inventoried, lab-packed and removed by specially-trained officers with KSP or local law enforcement. KSP coordinates the ultimate characterization and disposal of the waste materials by a contractor in accordance with state and federal hazardous waste management regulations. This guidance addresses the **decontamination** of residual contamination that exists after the bulk **removal** of chemicals and chemical wastes.

The main focus of this guidance is decontamination and sampling of meth and other chemical residues within "**inhabitable properties**". Kentucky's new meth cleanup law, codified at KRS 224.01-410 (2) (a) defines an **inhabitable property** as "...any building or structure and any related curtilage, water, water system, or sewer system used as a clandestine meth drug lab that is intended to be primarily occupied by people, including a mobile home, that may be sold, leased, or rented for any length of time. "Inhabitable property shall not include a hotel, as defined in KRS 219.011." This guidance uses meth as a surrogate chemical for all other drug precursors or "**related hazardous materials or hazardous waste**" as referred to in the statute, and is based on the premise that removal of meth will provide adequate decontamination of the other contaminants. It is acknowledged that there may be reagent or precursor labs where chemicals other than meth may be present. In these cases, additional testing may be required. Contact KDWM for more information.

A companion document, ***Contractor's Certificate of Decontamination (CCD)***, must be used to document interior and exterior assessment, decontamination, and post-decontamination sampling activities performed by the certified contractor, and will serve as a record of decontamination decisions and actions. A copy of the **CCD** must be submitted to KDWM and the local public health department where the meth lab is located within thirty (30) days following decontamination activities at the property. See Appendix B for the format of the report.

II. BACKGROUND INFORMATION

A. Individual and Agency Roles and Responsibilities

Kentucky's meth cleanup law, KRS 224.01-410, was passed during the 2007 Kentucky Legislative Session, and became effective on June 26, 2007. The law defines the roles and responsibilities for state and local agencies in its implementation. The primary purpose of the law is to ensure that meth lab properties are properly decontaminated so they can be safely re-occupied by future buyers or tenants. This requires a strong, cooperative effort among law enforcement, the local health department, the various state agencies, the property owner and the certified meth lab cleanup contractor to achieve this goal. See Figure 1 for a flow chart describing the steps involved and agency roles in dealing with meth lab cleanup based on the new law. The parties involved and their responsibilities are as follows:

The **Kentucky State Police or local city or county law enforcement** agency will identify and investigate potential clandestine drug lab properties. They will notify the local health department the day they become aware of a property contaminated by its use as a clandestine meth drug lab.

Once they receive notification from law enforcement, the **Cabinet for Health and Family Services (CHFS) or their staff in the local health department** for that county or area will post a **Notice of Meth Contamination** on each exterior door of the inhabitable property, except for multifamily housing units. In that case, the notice is posted on each entrance door to that unit.* The Notice shall duly warn the public, owners and renters of the possible contamination of the property and the health hazards posed by the meth contamination, per the provisions of KRS Chapters 211 and 212. The Notice shall remain posted until the property has been decontaminated by a certified contractor in accordance with the law and this guidance document. The local health department will remove the posting once a **Certificate of Compliance** is submitted by KDWM as noted below. At law enforcement's request, CHFS Child Protective Services may act as necessary to remove children from contaminated properties. CHFS staff also will advise local public health officials, law enforcement personnel, property owners and citizens on the toxicity and health effects of meth, and provide treatment options available to those who have meth or other drug addiction problems. For more information, see the **Agency Contacts** list at the end of this document.

** Decontamination of the inhabitable property followed by sampling will be required whenever the local health department posts a "Notice of Meth Contamination" on the inhabitable property as required by the law.*

Kentucky's meth cleanup law states "**Only contractors certified by the Environmental & Public Protection Cabinet (EPPC) shall be authorized to conduct the decontamination services for inhabitable properties**". Information on how to become a **certified contractor** is available on the Kentucky Division of Waste Management (KDWM) meth decontamination webpage <http://www.waste.ky.gov/branches/sf/Meth.htm>

This webpage has the application and financial assurance forms that are required as part of this program as well as other related information. EPPC is also required to maintain a list of vendors and certified contractors which is also available on the webpage. The following requirements must be met in order for a contractor to become certified:

Methamphetamine Contamination Remediation Flow Chart



1. Register with the cabinet;
2. Post a surety bond or obtain other financial assurance in the amount of fifty thousand dollars (\$50,000)**;
3. Provide a certificate of liability insurance for the minimum amount of \$250,000. This is to address any personal or property damages that might occur to third parties from the performance of decontamination services for inhabitable properties;
4. Certify that decontamination will be performed safely and in accordance with 803 KAR 2:043; and
5. Certify that each cleanup conducted meets the decontamination standard of 0.1 microgram of methamphetamine per one hundred (100) square centimeters (0.1 µg/100 cm²) of surface material.

*** KRS 224.01-410 (4) 2. requires the applicant to post a surety bond or obtain other financial assurance in the amount of five hundred thousand dollars (\$500,000). However, due to the difficulty in contractors being able to secure this bond value, until this provision is changed through amendments to the law, EPPC will allow the applicant to post a bond in the amount of \$50,000, with EPPC providing the remainder of the required surety bond.*

Kentucky Office of Occupational Safety and Health Administration (KyOSH) provides guidance and enforcement of worker safety regulations, training, equipment, and practices including certified contractors. KyOSH has determined that certified contractors who decontaminate inhabitable properties per the meth cleanup law fall under the scope of 29 CFR 1926.50 -1926.65, Hazardous Waste and Emergency Response Operations (HAZWOPER), as adopted and enforced by KyOSH under 803 KAR 2:403. Therefore, all certified contractors and site workers who perform decontamination services must have completed a minimum of 40 Hours of HAZWOPER safety training and field experience as required by law. To be certified, the contractor must submit certificates documenting all site workers have received 40 Hour training.

Certified contractors work *for* property owners and *with* state and local authorities to assess, sample, decontaminate, and dispose of wastes and materials removed from the property in accordance with the meth cleanup law, this guidance and all other state and federal laws. Certified contractors should understand the law and its requirements, perform assessment and decontamination of the property according to this guidance, and must document their decontamination activities through completion of the **Contractor's Certificate of Decontamination (CCD)**. See Appendix B. The CCD must be submitted to KDWM and the local health department within thirty (30) days following decontamination of an inhabitable property. **In this document the certified contractor describes the specific cleanup actions completed, the post-decontamination samples collected, and self-certifies that the property was decontaminated to meet the requirements of the law.** The certified contractor must follow the recommendations provided in this guidance document for decontamination of inhabitable properties or provide justification for other equally protective actions that were taken.

Once KDWM receives the CCD, the agency will issue a **Certificate of Compliance** to the **local health department**. The meth cleanup law has no requirement for the property owner to decontaminate the property, and does not impose a mandatory deadline for assessment or decontamination of inhabitable properties. However, the local health department will not

remove the posting of the Notice of Meth Contamination from the property, until it is decontaminated to meet the decontamination standard in the law verified through receipt of the Certificate of Compliance from KDWM.

The property owner is responsible for all costs associated with assessment and decontamination of the property. (Please see information below on applying for funds from **Kentucky Housing Corporation** if eligibility requirements are met.) Decontamination must be performed by a certified contractor selected by the property owner from the list available on KDWM's webpage. **If a certified contractor is not used to decontaminate the property, the Notice of Meth Contamination will not be removed by the local health department.** The property owner should understand the work plan and monitor progress on the site.

Even though the contractor must be certified by KDWM, the agency is not liable or responsible in any way for any actions or omissions of the contractor in the performance of decontamination of the property. In order to become certified, the contractor must provide proof of liability insurance, a surety bond and performance bond for purposes of financial assurance. The owner may also wish to receive copies of these documents from the certified contractor as they select a company to perform decontamination services. It is recommended that the owner check references and obtain estimates in selecting the certified contractor.

The new law also includes a provision for the **Kentucky Housing Corporation (KHC)** to establish a program to assist persons and families of lower and moderate income to help defray costs of assessment and decontamination services. KHC has created such a fund that property owners can apply for if they meet financial and other eligibility requirements. A person shall not be eligible for the program if convicted of a felony or found to be responsible for contamination of the relevant property through meth production.

For information on how to apply for funding through KHC, and for other information on meth and cleanup issues, please refer to the list of **Agency Contacts** at the end of this guidance document. This page will be updated as necessary to provide the most current contact information.

Discovery of possible meth lab properties. There may be instances where property owners, realtors, banks or other citizens discover chemical containers, strange odors of ammonia and other chemicals, evidence of spills, residues, and other materials indicative of a meth lab, but the property has not been reported to law enforcement and has not been posted as required by the law. In all cases, the person who discovers this material should evacuate the property, don't attempt to clean it, and contact the Kentucky State Police or local law enforcement. The property will need to be investigated, assessed or decontaminated as necessary in accordance with this guidance and the law before it can be used.

B. Meth Production Methods

There are various methods for making meth in common practice in the U.S. today. Most Kentucky meth "cooks" use variations of the *anhydrous ammonia method* (also called the Birch Reduction method or "Nazi" method). Kentucky law enforcement have also reported discovery of many *Red P lab* operations using red phosphorous. Other methods that are used include the P2P or Amalgam method (See *Appendix A, Methamphetamine Manufacturing Process and Common Manufacturing Chemicals*).

The physical evidence gathered and observations made by law enforcement during their initial entry at the scene, subsequent criminal investigation, and gross waste removal is the best

information that is available concerning the type of meth lab and possible chemicals that have been released into the structure. Therefore, it is critically important to factor the information contained in the law enforcement/first responder's report into the plan for assessment or decontamination. However, it should be noted that assessment or decontamination of labs cannot necessarily be based solely on the method being used at the time of seizure. The meth cooks arrested may not know or be truthful about "cooks" done in the past. Physical evidence at a lab may indicate only the most recent method used; therefore, all persons involved with a former meth lab must be aware of potential hazards created by each of the current meth cooking methods.

Although they have been found in the western U.S., Kentucky law enforcement has not yet seen many of the "Super Labs" where large volumes of meth are manufactured by several workers resulting in large volumes of chemical wastes. Seizure of a "Super Lab" or large capacity lab or discovery of new cooking methods or chemicals should be brought to the attention of KDWM so agency staff can discuss whether this guidance is appropriate and sufficient for the situation.

C. Meth Lab Chemical Contamination

Cooking meth by any method will result in the release of ingredient chemicals, the precursor drugs (pseudoephedrine or ephedrine), meth in vapor and particle form, and other largely unknown byproducts (See *Appendix A*). Airborne contaminants are absorbed into soft materials including rugs, furniture, drapes, walls and other surfaces and can also contaminate the heating, ventilation, and air conditioning (HVAC) system of the structure. Spills are common in meth labs, and can impact floors, walls, appliances, and other surfaces. Chemicals used in the cooking which may be hazardous are in some cases dumped down the sinks, toilets or drains in the kitchen or bathrooms and leave contamination in the waste water system.

During active meth cooking, law enforcement has found that levels of chemicals including iodine, phosphine, and hydrochloric acid used in several of the methods, could exceed current occupational standards and large amounts of meth are also released into the air and have been found at levels up to 16,000 micrograms per 100 square centimeters on surfaces.

Chemicals may enter the body by being breathed, eaten, injected (by a contaminated needle or accidental skin prick), or absorbed by the skin. Both acute (short term) and chronic (long term) health hazards result from the manufacturing of meth. Acute exposure hazards come from direct contact with product or waste, and inhalation of product or wastes. Burns, tissue irritation and rashes can result from chemical spills and skin contact. Headaches, dizziness, nausea, and other health effects can result from inhalation of vapors.

After the cooking process has stopped, most of the known hazards decrease. Proper removal of the production wastes and bulk chemicals eliminates many of the risks associated with meth labs. Spilled volatile chemicals and solvents such as ammonia, methanol, ether or acetone will move into air and will be readily removed from the structure by ventilation. Semi-volatile or non-volatile production chemicals such as acids, bases, precursor chemicals, and products used or created in the manufacturing processes are more persistent.

Smoking meth indoors will also distribute meth throughout the structure and the structure's contents. Handling meth, loading meth pipes or syringes, or packaging the drug for distribution may result in spills onto floors and other surfaces.

The risk of injury from chemical exposure depends on the chemical itself, the concentration, the quantity, and the length and route of exposure. Assessment of a lab site by the certified contractor should include special attention to:

- **Accessibility of residues and frequency of direct contact:** The likely use of a contaminated area is an important factor in estimating frequency of contact. For example, residues in a kitchen or bathroom of a house will likely be contacted more frequently than residues in a non-residential outbuilding.
- **Characteristics of the inhabitants or users of the structure:** For example, toddlers who crawl on carpet or floors will have high frequency of skin contact with toxic residues over a considerable area of skin. These residues may directly irritate the skin, and may also be absorbed into the body through the skin. If hand to mouth behavior occurs when hands have been in contact with toxic chemicals, these will be ingested into the body. Hand to eye behavior will introduce toxic materials to the eyes. Toddlers are at greatest risk for hand to mouth and hand to eye behaviors, but all people exhibit them.

The toxicity of meth lab residues will depend upon the amount of the residue, and the chemicals in the residue. The amount of residues will depend upon the size and type of meth lab, the length of time it operated, methods of chemical storage and disposal, occurrence of chemical spills, as well as the physical characteristics of the structure in which the meth lab occurred. The chemicals in the residue will vary with the method of meth cooking.

D. Meth Risk Decisions and Cleanup Standards

The process of meth lab risk assessment is complicated by the fact that solid research information is not available regarding:

- impact on human health from exposures within a meth-contaminated structure,
- absorption by skin or distribution of meth throughout the body,
- levels of meth in air of former meth labs that may be harmful,
- an established safe level for meth in the environment.

Many states currently use a cleanup standard ranging from 0.05 to 0.5 micrograms of methamphetamine per one hundred square centimeters ($\mu\text{g}/100\text{ cm}^2$) for meth in surface wipe samples. **The decontamination standard set by Kentucky's meth cleanup law is 0.1 micrograms of meth per 100 square centimeters ($0.1\text{ }\mu\text{g}/100\text{ cm}^2$) of surface material,** unless the cabinet promulgates an administrative regulation providing for a different standard. The cabinet may also promulgate standards for precursors to methamphetamine that are consistent with the standard for meth or standards for related hazardous material or hazardous waste.

When states originally established cleanup standards for meth, due to lack of health effects information and toxicity data, they were based primarily on the lowest level an analytical laboratory could reliably achieve. However, a 2005 study by the Colorado Department for Public Health and the Environment found that the cleanup standards used by several states including Kentucky are protective of human health based on expected child and adult exposure.

Furthermore, research from the State of Minnesota has shown that sampling for meth may not be a reliable measure of the entire volume of meth in a structure. **Therefore, this guidance focuses heavily on a decontamination process that is practical and can be implemented**

coupled with the collection of post-decontamination samples to confirm that the standard has been achieved. It is hoped that the overall cleanup process will reduce risk by reducing exposure to contamination, through a combination of cleaning, disposal, decontamination and encapsulation activities described below.

In planning the decontamination and assessment of an inhabitable property, **it is assumed in this guidance that the property will be re-occupied for residential use either by a future owner or a tenant who may lease or rent the property.** Therefore, the recommended decontamination measures are designed to reduce the overall mass of meth and other chemical contamination that may exist in the property to reduce the risk of exposure to future occupants. Post-decontamination sampling is required in order to confirm that the decontamination standard has been achieved, so the Notice of Meth Contamination posting can be removed by the health department, and the property may be reused.

All inhabitable properties that have been posted by the health department must undergo either 1) Limited Decontamination, or 2) Full Decontamination as determined by the certified contractor based on information and data collected from the Preliminary Assessment, the law enforcement/first responder report, and evidence observed at the site. This is further discussed in Section V. Interior Decontamination.

This guidance is based on the presumption that all rooms and all structures on a meth manufacturer's property are considered potentially contaminated. Therefore, these are the standards set forth by this guidance:

- All inhabitable properties containing a meth lab or chemicals must be decontaminated following the procedures in this guidance.
- All non-occupied structures on a property where meth labs or chemicals are found must be inspected, assessed and decontaminated, if necessary. This includes outbuildings, detached garages, and sheds. These structures are likely locations of storage of chemicals and finished products.

III. CHEMICAL SAMPLING/SCREENING

A. Meth Sampling Options: Wipe Sampling and Micro-Vacuuming (See *Appendix C* for sampling procedures)

Meth wipe samples are typically collected by wiping a wall or other hard surface with a solvent dampened wipe. Gauze pads, sponges or filter paper wetted with methanol are often used for surface wipes. For many building materials, the amount of meth removed by wipe collection from the surface is a small fraction of the total amount of meth present in the building material due to the material's surface texture and porosity. Meth wipe samples **may** be taken as part of the Preliminary Assessment conducted by the certified contractor to help determine site conditions before decontamination and to possibly help in guiding cleanup efforts. However, **wipe samples of the surfaces most likely to be contaminated, must be taken following decontamination activities to demonstrate compliance with the decontamination standard of 0.1 ug meth per 100 square centimeters (0.1 ug/100 cm²).** See Section VI. Post-Decontamination Sampling for specific meth sampling and analytical requirements. Several meth wipe sampling kits are available by a number of vendors, and are useful in screening areas to determine if additional decontamination may be necessary or if one should collect

quantitative wipe samples to meet the standard. However, results from wipe sample kits cannot be used for final post-decontamination sampling to meet the decontamination standard.

“Micro-vacuuming” is an optional non-destructive method for sampling porous building materials such as raw wood, brick and unpainted cement block. Micro-vacuuming can also be used on carpeting but is less reliable for use on other fabrics. Micro-vacuuming collects meth-contaminated dust and particles *on* building material and *trapped by* surface texture of porous materials. Although micro-vacuuming does not calculate the concentration of meth within the material, this sampling method detects the presence of meth on some materials more reliably than wipe sampling, and is recommended by this guidance for the materials noted above if it is requested by the property owner to retain high value items including furniture and appliances. Although this sampling method is optional, the data from micro-vacuuming along with surface wipe data can be evaluated to determine the overall effectiveness of decontamination.

B. Chemical Screening

Under this guidance, testing or screening may include:

- wipe sampling for meth (required by Kentucky’s meth cleanup law to demonstrate compliance with decontamination standard),
- micro-vacuum sampling of porous materials (optional except to rule out decontamination or retaining items of high value),
- volatile compounds monitoring in air (recommended), or
- surface pH evaluation (recommended)
- lead and mercury testing (required only if P2P lab is found)

Indoor chemical-specific testing and screening requirements are listed in **Table 1** below and described further in the following text. Lead and mercury testing should be limited to illicit drug laboratories where there is clear evidence or high suspicion of use of these metals. All areas tested must be photographed to document the location of the sampled area.

Table 1: Sampling or Screening Levels and Their Meaning in This Guidance

Chemical	Interpretation and/or Action Taken
Methamphetamine	The decontamination standard for meth is 0.1 µg/ 100 cm² (all surface materials must be cleaned to this level).
Corrosives (Acids/Bases)	Clean or neutralize to: pH 6-8
Volatile Compounds (solvents)	Clean/ field screen to: < 1 ppm total volatiles in air (PID or FID)
Phosphorus/Iodine	Properly dispose of stained/affected material (can screen for iodine with spray starch)
Mercury/Lead	Contact KDWM if a P2P (Amalgam) lab is found.

Corrosives: Commonly used corrosives include but are not limited to Hydrochloric Acid, Sulfuric Acid, Sodium Hydroxide, Anhydrous Ammonia, Phosphoric Acid and Muriatic Acid. Surface pH testing during the assessment process is recommended and should provide reasonable assurance that common acids and bases are not present at levels posing a health hazard.

Volatile Chemicals (VOCs): Commonly used VOCs (solvents) include but are not limited to Acetone, Benzene, Ether, Freon, Hexane, Isopropanol, Methanol, Toluene and Xylene. Ammonia also is a volatile inorganic compound that can be detected through screening. VOC screening should be conducted in all rooms of the structure, for the safety of workers as well as for assessment purposes and to verify decontamination. VOC screening can also be used to detect sources of residual organic vapor contamination, such as in heating vents, plumbing and sewers.

Phosphorus and Iodine: Removal of stained materials is the best means of remediating contamination involving red phosphorus, iodine crystals, and tincture of iodine. Spray starch can be used as a screen for the presence of iodine residues. When removal of stained material is not a reasonable option (such as on a concrete floor), the surface can be power-washed, allowed to dry, and then sealed.

Mercury and Lead: Please contact KDWM if a P2P lab is suspected which may involve the use of lead acetate and mercuric chloride. Typically, the processes (methods using phenyl-2-propanine (P2P) precursor) that used lead and mercuric compounds have been abandoned in favor of simpler methods using lithium or sodium metal, or red phosphorus and iodine.

IV. PRE-DECONTAMINATION GUIDELINES

A. Certified Contractor Requirements

Decontamination of an inhabitable property in Kentucky must be completed by a contractor certified by the Environmental & Public Protection Cabinet. See KDWM's webpage on how to become a certified contractor. The certified contractor must conduct meth lab assessment, sampling and decontamination using the procedures of this guidance, and in accordance with KRS 224.01-410. In addition to the KyOSH-required HAZWOPER safety training, it is strongly recommended that the certified contractor and staff who will be decontaminating meth labs, receive specialized meth lab or clandestine drug lab training. A number of states including Tennessee and Indiana, as well as private vendors offer meth lab cleanup training that would be beneficial in developing an understanding of the issues affecting meth lab sites and decontamination. See KDWM's webpage for links to other states' programs for information on upcoming training classes.

Once decontamination is completed, the certified contractor must perform the post-decontamination sampling to determine compliance with the decontamination standard (see section VI for sampling protocols). It is also the responsibility of the certified contractor to arrange for disposal of all waste materials, inspect the dumpster, truck, roll-off box or other container of structure contents and waste prior to the waste leaving the site. Inspection is done to ensure that no hazardous chemicals, containers of anhydrous ammonia, or biohazards (sharps, etc.) are improperly disposed. The certified contractor must also ensure that all furniture, clothing, carpeting, and other items disposed have been destroyed or rendered

unable to prevent scavenging of these items. All wastes must be disposed of in accordance with state and federal EPA and DOT regulations.

A *Contractor's Certificate of Decontamination (CCD)* must be submitted to EPPC (Kentucky Division of Waste Management), the local health department and the property owner by the certified contractor within thirty (30) days after decontamination services are performed on a property. The *CCD* report documents the assessment, decontamination and decisions made at a site. The *CCD* report format is provided in Appendix B of this guidance.

KDWM reserves the right to conduct oversight, either with its own staff or a qualified contractor, of the meth lab decontamination activities performed by the certified contractor and to collect its own post-decontamination samples to verify that the decontamination standard was met.

The certified contractor and the property owner must retain all records related to the decontamination of the inhabitable property for a period of at least five (5) years after the *CCD* has been issued. This includes the *CCD*, preliminary assessment findings, all data and laboratory analytical results of the post-decontamination sampling and quality assurance/quality control records, and field sampling logs.

B. Lab Site Entry

Once notified by law enforcement, the local health department will post signs on the exterior doors of the property with *Notice of Meth Contamination* signs warning of possible chemical contamination. The notice will remain on the property until it has been decontaminated by a certified contractor in accordance with the law and this guidance document. There may be some circumstances when the local health department will allow the occupants of a multi-family housing unit, i.e., apartment or duplex located adjacent to the meth lab to remain in place, e.g., when law enforcement feels certain that the second structure has a separate HVAC system and was not involved or impacted by meth lab cooking in any way. This is a case by case determination based on site-specific factors.

Before entering the site, the certified contractor should carefully consider the hazard potential from exposure to chemical residues, confined spaces or other physical hazards, and proper personnel protective equipment (PPE) to perform the decontamination. It is the contractor's responsibility to ensure that all personnel under their supervision have the necessary safety equipment and that their work activities are conducted safely in accordance with KyOSH regulations in 803 KAR 2:403, and 29 CFR 1926.50 to 1926.65, the construction industry standard and the federal HAZWOPER regulations for General Site Worker. Keep in mind many of the spaces that will require entry and cleaning could meet the definition of a **Confined Space** per 803 KAR 2:200, and may require specialized training.

The certified contractor should always wear the appropriate personnel protective equipment (PPE) including respiratory protection if needed, based on site conditions and air monitoring data, and based on the type of work they are performing. Monitoring/sampling equipment should include, but not be limited to:

- A photo-ionization detector (PID), flame ionization detector (FID) or similar device to check for the presence of organic vapors in the air. The instrument must be properly calibrated and maintained,
- pH paper,

- De-ionized water,
- Camera (for documentation),
- Ruler and masking tape or pre-fabricated 10 cm by 10 cm template,
- Sample collection supplies including gauze pads, methanol, sample containers and cooler.

One hazard that should not be overlooked when assessing or decontaminating a meth lab is hypodermic needles. Needles can sometimes be mixed in with the trash and other wastes and can be found in furniture or intentionally hidden in unexpected places. The potential for transmission of blood-borne pathogens including HIV/AIDS or hepatitis through needle “sticks” can be a significant hazard for sites where “users” were present. Because of the possibility that the needles can penetrate personal protective equipment (PPE), extra caution should be taken by the certified contractor and their staff. Also, some labs may have “booby traps” in place to make it difficult for law enforcement or others to access parts of the property. Caution should be taken when entering or investigating any former meth lab property.

C. Preliminary Assessment

The certified contractor must conduct a preliminary assessment of the property and all structures on the property. This information will be critical to how the property should be effectively and safely decontaminated and to determine the level of decontamination that is necessary. Information to be collected and documented during the preliminary assessment should include but is not limited to:

- Property description (i.e., physical address, latitude and longitude, legal description (if possible), physical layout of the property, structural features, etc.)
- Copies of any law enforcement/first responder crime scene reports or other reports detailing illegal drug activity, type of meth cooking process (based on materials found), materials removed from the property and materials’ locations
- Photographic documentation of site
- The following should be recorded:
 - 1) apparent hazardous chemical use or storage areas (if additional suspected meth waste containers or equipment are found, law enforcement should be contacted and the materials containerized until disposal),
 - 2) apparent waste disposal areas,
 - 3) presumed cooking areas identified by visible contamination or by law enforcement reports mentioning location of labs or lab equipment***
 - 4) chemical stains, fire damage, other observable contamination/damage, and
 - 5) information about surfaces, furnishings, appliances, and other features
- Inspection of HVAC system
- Inspection of plumbing, septic system, sewer system
- Inspection of garages, barns, and other outbuildings on the property
- Identification of adjacent areas/units in multiple dwellings that may require cleaning
- Identification and documentation of areas of contamination
- Outdoor inspection for evidence of burn or trash pits, discolored soil, or dead vegetation, indicating possible contamination of water and/or soil
- Inspection of well or city water connection
- Identification of neighboring structures, wells, surface water, and other potential receptors within 250 feet of site.

*** *Note: Pre-decontamination sampling is not required, but samples may be collected of suspected cooking areas, spills or stained locations, waste disposal areas, HVAC system, plumbing fixtures, and other locations to determine the most effective plan for decontamination of the property. Once the property is decontaminated, post-decontamination samples are required.*

D. Site-Type Considerations

The layout of the lab, its structural characteristics and potential future use must be considered when designing a decontamination plan. Although the recommended decontamination measures would be similar to those contained in this guidance, Kentucky's meth cleanup law does not include meth labs found in hotels, motels, portable labs, or vehicles in its definition of inhabitable properties subject to decontamination, therefore this guidance does not address these potential meth lab scenarios. **Contact KDWM at (502) 564-6716 if these or other situations are found and not addressed in this guidance.** Lab sites may be loosely categorized as follows:

- **Private occupancy structure**, e.g., single family home and attached garage, apartment or multiple dwelling
- **Mobile residence**, e.g., motor home, camper or manufactured home
- **Non-occupancy structure**, e.g., detached garage barn, pole barn, tool shed, etc.

The following special considerations apply to site type and use:

- Private (e.g., apartment building) **multiple dwellings** require careful assessment when determining how much of a structure must be evacuated and subsequently decontaminated. As stated in Section IV. B., this is a case by case call made by the local health department, based on the factors of the meth lab site. Adjacent rooms and common areas of multiple dwellings are presumed contaminated and must be decontaminated, or sampled to rule out need for cleaning.
- Based on contractors' past experiences with cleanups of mobile homes, campers and other **mobile residences**, these structures contain more porous and absorbent materials than fixed structures, and therefore, may be difficult and costly to decontaminate. Demolition should be considered as a more cost-effective option.
- Non-occupancy structures like detached garages, barns, and sheds must be inspected by the certified contractor and must be decontaminated if believed to be used for cooking or storage of raw or finished product.

V. INTERIOR DECONTAMINATION PROCEDURES

A. Decontamination Options

All inhabitable properties that have been posted by the health department must undergo either 1) Limited Decontamination, or 2) Full Decontamination as determined by the certified contractor based on information and data collected from the Preliminary Assessment, the law enforcement's/first responder report and other evidence observed at the site. Pre-decontamination sampling cannot be conducted in order to demonstrate compliance with the decontamination standard. KDWM reserves the right to provide oversight of the decontamination activities and to collect samples as necessary.

Although the property owner may assist the certified contractor in providing technical information about the inhabitable property, due to health and safety reasons, the owner cannot perform decontamination of the property unless they are a certified contractor.

1) **Limited Decontamination**

For properties meeting the following criteria, a limited decontamination of the property will be required, followed by post-decontamination sampling. See Section VI. Post-Decontamination Sampling for the sampling requirements.

- a) For short-time “transient cook” meth cooking operations, typically at a location where the meth cook did not live or work,
- b) Crime scene evidence indicates it is uncertain if a meth cook was completed, or that only one or two small cooks were completed; with a small amount of meth produced (less than 2 ounces). Limited amounts of reagents or precursors were present and used.
- c) The property has little, if any, evidence of spills, or meth lab chemical contamination,
- d) The posted property is part of a multiple housing apartment unit or duplex located adjacent to an identified meth lab and where the HVAC system is separate for each unit.

2) **Full Decontamination**

All other properties that are posted by the health department and do not meet the above criteria for the Limited Decontamination sites must follow the steps listed under Full Decontamination. If the evidence gathered by law enforcement at the crime scene or results of the Preliminary Assessment cannot definitively determine if the property meets the criteria, as a default, the property must be decontaminated following the Full Decontamination procedures. This includes properties where the crime scene indicates evidence pointing to a longer term meth cook operating in a residential or rental property setting for several weeks to several months, producing larger amounts of meth product. Chemical spills, and stains are commonly observed.

B. Decontamination Steps

Limited Decontamination In a limited decontamination, the main focus is to remove and/or commercially clean all soft, porous items that could contain elevated levels of meth and other chemicals and to thoroughly wash all hard surfaces and any other locations in order to reduce the potential risk of exposure to even low levels of chemical residues by future residents. At a minimum, the following steps should be taken.

- 1) Conduct Preliminary Assessment as provided in Section IV. C and document and photograph all cleanup actions in the CCD report. See App. B for the format.
- 2) Ventilate the structure for at least two days
- 3) Conduct air monitoring to determine proper PPE and to help identify contaminated areas for thorough cleaning.
- 3) Replace air filters in HVAC, and clean ventilation ducts. Do not turn on HVAC system until the components that can be reached are thoroughly cleaned.
- 4) Thoroughly clean any spill areas, and wash all hard surfaces with water and detergent. This includes appliances, floors, walls, ceilings, and other areas.

- 5) Commercially shampoo or clean rugs, steam clean draperies, bedding and mattresses, and cloth furniture. Remove carpets and rugs if they are stained.
- 6) Remove and dispose of all clothing or other soft items where meth and other chemical residues could be absorbed including fabrics and children's toys. The materials must be rendered unusable before placing outside or packaging for disposal.
- 7) Properly dispose of all waste materials per state and federal regulations
- 8) Where appropriate, all washed surfaces are to be painted or sealed.
- 9) Collect post-decontamination samples per requirements in Section VI.

Full Decontamination The basic steps to fully decontaminate a former meth lab structure are listed below and described further in the following text.

- **Initial Ventilation:** Ventilate structure for at least two days before decontamination and during the cleanup process.
- **Air Quality:** Perform air sampling to determine proper PPE before and after decontamination.
- **Plumbing and Sewer:** Inspect plumbing and sanitary sewer; discard etched or stained fixtures; flush plumbing.
- **Chemical Spills:** Evaluate and clean chemical spills and residues.
- **Porous Items:** Remove and dispose of upholstered furniture, curtains, mattresses, paper items, and other porous contents including clothing not to be cleaned.
- **Children's Belongings:** Remove and dispose of clothing, toys, bedding, baby bottles and cups, and other personal items used by infants and small children.
- **Porous Materials:** Remove and discard carpeting, wallpaper and/or wallboard, suspended and attached ceiling tiles.
- **Optional Decontamination:** Under certain circumstances some selected high-value, hard-surface items including appliances may be reused following cleaning, HEPA vacuuming and sampling.
- **Disposal:** Dispose of all contaminated contents in a sanitary landfill.
- **Structural Cleaning:** (a) HEPA vacuum porous building materials such as concrete block, brick, raw wood studs, wooden floors and all floors under removed carpeting. (b) Double wash with detergent and hot water, followed by a thorough rinse with clean water. Alternatively, concrete and raw wood can be steam cleaned with extraction.
- **Area Segregation:** After each room is cleaned, cordon off doors and openings to other rooms using (at least) 4-mil plastic sheeting to avoid recontamination.
- **HVAC Cleaning:** Clean heating, ventilation and air conditioning (HVAC) system. Replace filters at the end of the decontamination process.
- **Encapsulation:** Encapsulate residual contaminants with two coats of sealant or paint. Paint should be sprayed and not brushed or rolled. Paint should be allowed to cure for the recommended time between coats.
- **Final Ventilation:** Ventilate structure for at least two days after cleaning.
- **Exterior (Outdoors) Evaluation:** Perform outdoor investigation including the septic system and contact KDWM if evidence of dumping or releases of hazardous substances are noted. See Sec. VII Exterior Evaluation.

C. Ventilation

Ventilation of the structure is recommended before, during and after the decontamination process except when ventilation may interfere with air sampling. Open all windows and use

exhaust fans, blowers and/or negative air machines for a minimum of two days before and after cleaning. Take care that vented contaminants are not exhausted to air intakes of adjacent structures. **Do NOT operate the HVAC system until the entire structure is decontaminated in order to prevent spread of contaminants.** Also take care to provide adequate ventilation during sampling and painting. Respiratory protection may be necessary as part of PPE during decontamination, if adequate ventilation cannot be achieved (e.g., in very cold weather); during the use of solvent cleaners or sampling materials; while removing carpeting and other highly contaminated materials.

D. Indoor Air Quality Testing

Indoor ambient air should be screened before and after the decontamination process (or during the process as deemed necessary by the certified contractor) using a Photoionization Detector (PID), Flame Ionization Detector (FID) or similar instrument (see *Appendix C3*). Initially, a sweep through the entire building should be made with an accurate record kept of all readings in every room. This will also assist the certified contractor in determining the proper level of PPE for the workers. Additionally, each septic system drain (floor, tubs, sinks) should be tested with the PID to determine if any chemicals have accumulated in the drain trap.

E. Heating Ventilation and Air Cooling (HVAC) System

Assessment of HVAC system should be performed early in the decontamination process. **Do NOT operate the HVAC system until the entire structure is decontaminated in order to prevent spread of contaminants.** Depending on the assessment and the system, the following steps may be required:

- During the decontamination of each room or area:
 - Remove and clean, or replace all vents.
 - Thoroughly HEPA-vacuum the ductwork and clean the entire HVAC system. Flexible ductwork may be difficult to clean, and in some cases may promote mold growth if the water used during cleaning is not completely removed. Therefore, it is recommended that this ductwork be removed and replaced.
- Remove and clean, or replace supply diffusers (based on cost efficiency).
- Replace all filters in the system at the end of the decontamination process and after all dust disturbances have occurred.

F. Evaluation of Chemical Spills

All food preparation counter-tops, stained materials, powders and liquids throughout the structure should be pH tested (see *Appendix C3*) to determine their corrosivity. An accurate record of findings should be made.

Acids should be neutralized with sodium bicarbonate (baking soda); and bases with weakly acidic wash solutions (e.g., vinegar, citric or acetic acid). Solids can be containerized for proper waste disposal. Liquids can be adsorbed with clay or another non-reactive material and packaged for proper waste disposal. pH paper should be used to check a surface after neutralization. Stained or visibly-contaminated materials should be removed and disposed.

G. Structure Contents and Furnishings

As a rule, most **personal belongings** found in a former meth lab structure are presumed contaminated and should be discarded. At the discretion of the property owner in consultation with the certified contractor, some items may be: (a) cleaned without sampling, (e.g., eye glasses, adults' clothing, major appliances) or (b) cleaned and sampled (e.g., high-cost, low contact large furniture and appliances, and other items). Decisions must be based not only on cost-effectiveness and value of the item, but also on the potential future use of the items, and potential for contact. Table 2 and the following text provide some guidance and recommendations for evaluating the contents of the structure.

Table 2. Value and Contact Potential Evaluations

<p>High Value – High Contact Items E.G., Mattresses, carpeting, large upholstered items should almost always be discarded. (See exceptions in text.)</p>	<p>High Value – Low Contact Items E.G., In some circumstances, photographs may be salvaged without cleaning, or large appliances may be cleaned and saved.</p>
<p>Low Value – High Contact Items E.G., clothing, plastic toys and toothbrush should always be discarded. (See exceptions in text.)</p>	<p>Low Value – Low Contact Items E.G., A screw driver, garden rake or other metal or hard material item may be cleaned in some circumstances.</p>

Household contents and guidance for their disposition are listed below. The list is not exhaustive. Recommendations for household contents are divided into three categories: **1) Always Discard, 2) Disposal Strongly Recommended and 3) Disposal Recommended.**

Infants' and Small Children's Clothes, Toys and Personal Items:

Always Discard.

Exceptions: Metal or other hard medical devices such as glasses or orthopedic devices that can be cleaned may be exempted in consultation with the contractor regarding decontamination options.

- **Other Fabric Goods:**

- Fabric Goods: Washable

Disposal Strongly Recommended.

Exceptions: With **reasonable assurance** that the work will be done, adult clothing and small washable fabric items such as curtains, rugs and linens can be machine-washed twice with hot water and detergent. After washing contaminated items, the washer should be run once empty of clothing.

- Fabric Goods: Non-Washable, Such as Woolens, Rubber-Backed Draperies
Always Discard.

- Mattresses

Disposal Strongly Recommended.

Exceptions: When pre-decontamination samples show low levels of meth in the structure, a mattress that is far removed from the area of cooking can be sampled to avoid disposal.

- Carpeting
Always Discard.
- **Kitchen Goods:**
 - Dishes, Flatware, Other Hard Items, Including Glazed Ceramics, Metals and Glass
Disposal Recommended.
Exceptions: With **reasonable assurance** that the work will be done, hard (non-porous) household items such as glazed ceramics, metals and glass may be twice-washed rinsed using detergent and hot water. Any item that shows evidence of use for meth cooking (e.g. acid etching, chemical staining) must be discarded.
 - Small Wooden, All Plastic Kitchen and Household Items
Always Discard.
- **Furniture:**
 - Large Wooden and other Hard Furniture Items, Including Metal, Glass and Aluminum
Disposal Recommended.
Exceptions: Attempts can be made to wash large, **hard furniture items** (e.g., non-plastic, wooden, chrome or aluminum). These items should be washed twice with detergent and hot water followed by thorough rinsing. After cleaning, wipe sample with methanol surfaces that will be touched, such as a dresser drawer face or chair seat.
 - Leather or Fabric Upholstered Furniture
Disposal Strongly Recommended.
Exceptions: Irreplaceable or very high-value items may be stripped of padding and upholstery and cleaned as hard furniture. After cleaning, wipe sample with methanol surfaces that will be touched, such as a dresser drawer face or chair seat.
 - Plastic Furniture and Large Plastic Goods
Always Discard.
- **Books and Household Paper Items:**
Always Discard.
Exceptions: Important legal papers, historical items or personal photographs may be exempted in consultation with the certified contractor.
- **Appliances, Tools, and Electronics:**
Disposal Recommended.
Exceptions: If the property owner in consultation with the certified contractor agrees, high-value, low-contact appliances, tools and electronics can be washed twice with a hot detergent solution and clean rinse water, or cleaned by alcohol wiping with adequate ventilation. Stained items must be discarded.
Decontamination to clean an approved high-value item should include aggressive HEPA vacuuming followed by extraction shampooing or extraction steam cleaning, washing, or other method approved by the local authority. After cleaning, wipe samples

from an exposed horizontal surface of the piece must demonstrate **less than 0.1 µg meth per hundred square centimeters (< 0.1 ug/100 cm²)** of the exposed surfaces.

Following removal of room contents, **HEPA vacuuming** is mandatory to remove residual contaminated dust from floors under removed carpeting. HEPA vacuuming may also be useful to reduce contamination on and in raw wood, concrete and other porous surfaces but is very time-consuming and is not required.

H. Structural Features and Surfaces

Acoustic ceiling tiles, suspended or attached, should be removed for disposal.

“Popcorn” ceilings may contain asbestos. In lieu of testing the material for asbestos, the certified contractor may presume it has some asbestos-containing material. If the ceiling is intact, the best option is to leave the ceiling in place and seal with a sprayed-on asbestos-encapsulating product. Sealing will also satisfy meth decontamination requirements. More information on asbestos abatement can be found at: <http://www.air.ky.gov/programs/asbestos/>

Walls, floors, and ceilings without “popcorn” texture must be double washed with hot water and detergent and rinsed with clean water to remove surface meth and prepare for painting or sealing. First clean the ceiling, next clean the walls, and finally clean the floors. Washing must include frequent changes to fresh cloth rags and detergent solutions, and rinsing of the surface with clean rags and fresh water. Capture of all cleaning and rinsing solutions from the surface being cleaned is critical to remove meth. Wash waters can be disposed of in a sanitary sewer, or in a functioning septic tank/drainfield system. **DO NOT USE CHLORINE BLEACH DURING DECONTAMINATION.** Recent studies indicate that using chlorine bleaches can create chloroephedrine and other toxic chemical compounds when combined with iodine and meth, therefore non-bleach detergents should be used.

Wall materials (dry wall, sheetrock) that are in the suspected cooking area that are stained or discolored should be removed and replaced. Other walls not in the cooking area can be washed as noted above.

Resilient **floor coverings** such as laminate or tile vinyl in the room(s) used for cooking should be removed or replaced, or after cleaning, covered in place with new floor coverings. Ceramic or stone-tiled flooring in the room used for cooking should be removed, cleaned, re-glazed, or have the grout stained using an epoxy-based stain.

Any **wooden counter or food preparation surface** must be removed and disposed. There are no exceptions.

To avoid disposal, hard and non-textured **food preparation surfaces and counters** (stone, tile) should be washed twice with hot water detergent followed by thorough rinsing. Counter-top grout should be ground down, regouted and sealed. A post-decontamination sample indicating **greater than or equal to 0.1 µg meth per hundred square centimeters (< 0.1 ug/100 cm²)** on a counter surface will indicate need for additional cleaning and/or disposal.

Any **surface with stains or etching** should be considered contaminated and removed. Staining occurs most frequently with the Red P method. However, both the anhydrous ammonia and Red P methods use corrosive agents that can cause staining or etching of surfaces.

Hard, non-porous, smooth structural furnishings such as bathtubs, mirrors, windows, and doorframes should also be washed twice with hot detergent solution and water rinsed.

Painted and unpainted **cement and cement block** may be power washed, with wash water collected. The wet vac used for collection must be decontaminated after use. Alternatively, steam clean the material with extraction of the cleaning solution. **Brick and raw wood** are difficult to wet clean as the materials absorb the cleaning solutions.

Area Segregation As each room is decontaminated, it should be sealed off with 4-mil plastic (at least) sheeting to prevent recontamination as the work continues on the rest of the structure. It is recommended to start cleaning the least contaminated rooms first. It is also recommended to do a preliminary cleaning of the floors first before cleaning ceilings to walls. Final cleaning of the floors should be done after the ceilings and walls have been washed. These practices may help to minimize potential tracking of contamination into already-cleaned rooms and can save time and money spent in re-cleaning areas.

I. Encapsulation

Walls, ceilings, floors, and woodwork must be coated with paint or polyurethane after cleaning to isolate the remaining meth residue. Some studies show that meth can “wick” through paint. Apply at least two coats of high quality paint or polyurethane. A primer coat will improve adhesion of the second coat of sealant. Paint should be sprayed and not brushed or rolled. The first coat must be allowed to cure per the product recommendation before applying second and third coats. Oil, urethane, and epoxy products may provide a superior encapsulation to latex products, but these products require more care and ventilation to apply than do latex products. Glossy latex paint may provide superior encapsulation to semi-gloss or flat latex.

Sealing of **cement, raw wood, brick** or other porous materials is required in living space and recommended in other locations. Ceramic or stone tile should be re-glazed and the grout stained with an epoxy-based stain.

J. Plumbing and Sanitary Sewer

Meth chemicals poured down the drain during active cooking can be safety hazards in the plumbing system and environmental hazards in the wastewater treatment system. When corrosive or flammable chemicals have been dumped into a plumbing system, plumbing may contain concentrated chemicals in the traps of sinks and other drains. Attempting to pump out substances or remove the traps may result in chemical exposure and possible serious injury.

Sinks, bathtubs and toilets are frequently used for the disposal and dumping of lab chemicals. Visibly contaminated, stained or etched sinks, bathtubs and toilets should be discarded. Undamaged porcelain and stainless steel can otherwise be successfully cleaned.

Before cleaning plumbing fixtures, the certified contractor, equipped with chemical resistant protective disposable clothing, chemical-resistant gloves, and face-splash protection, should first thoroughly flush all plumbing traps with cold water. Every plumbing trap should then be checked with a PID or similar organic vapor meter (see *Appendix C3*). After flushing, collect substances in the trap to check pH using a long-handled tongs and cotton gauze. For garbage disposals, the trap cannot be easily accessed and will require removal for checking.

Waste chemicals discarded in the sanitary sewer are typically flushed from the system within minutes or hours of the disposal. However, if the connection is on a very low flow line the chemicals could remain in the line longer. The city sewer department should be notified when city water systems may have been affected, and may want to assess conditions in the sewer lines or flush the line with water.

For meth lab sites with an on-site septic system, see Section VII. Exterior Evaluation.

K. Garages, Outbuildings, and Non-Occupancy Structures

Although KRS 224.01-410 only requires decontamination of inhabitable properties which are intended to be primarily occupied by people, it is strongly recommended when planning decontamination, that all garages, sheds, and other non-occupancy structures be assessed and decontaminated as necessary. Consideration should be given to the structure's use, to potential for human exposure, and to the level of contamination within that structure. For example, a contaminated child's play house (or a structure used as a child's play house) should be cleaned and painted the same as a room in a residential structure. Meth contamination in a storage shed poses far less hazard to future occupants, therefore would not require the same level of decontamination.

The following steps should be taken in non-occupancy structures:

- Ventilate structure before cleaning.
- Inspect for stains and meth lab materials.
- Discard porous low value contents.
- When there is a dirt floor in the building, decontamination must be based on assessment. In some cases, it may be necessary to scrape and dispose an inch or more of dirt floor.
- Washing options:
 - Power-wash if possible (e.g., wiring or other obstacles may make power-washing impossible).
 - When power-washing is not possible, HEPA vacuum raw wood, cement, fiberglass or concrete block.
 - With mixed materials, do a combination of these.
- Spray paint or sealant on all surfaces.

Contents within outbuildings vary in degree of human contact and ease of cleaning. If a child is not exposed to the item, or if the item is made of metal or other non-porous, hard materials, the item may be able to be cleaned. For example, a child's bicycle, a hammock, or a set of coveralls in a barn used for meth cooking could be disposed, or thoroughly cleaned as described above. High-value, low contact, hard materials, e.g., a chain saw or lathe may be wiped clean with a solvent in a well-ventilated area or outdoors.

L. Waste Characterization and Disposal

All **meth-making chemical equipment or waste**, including precursor pharmaceuticals, drug cooking or use paraphernalia, non-empty containers of potential precursor chemicals, sludges, suspicious propane cylinders or fire extinguishers, and other potential evidence must be reported to KSP or the lead law enforcement agency if found on the property. The materials must be properly characterized and disposed in accordance with state and federal regulations.

Contaminated structural materials, household furnishings and personal property may be handled as municipal solid waste. Materials may be disposed of in a properly permitted sanitary landfill. All furniture, carpeting, clothing, and personal property should be cut apart or otherwise rendered unusable to scavenging.

The gloves, cartridge respirators, protective clothing, and other **personal protective equipment**, and cleaning materials used at a site may be disposed of as municipal solid waste.

Wash and rinse waters **may be disposed to a municipal wastewater collection system, or into a properly functioning septic system.** Pump and dispose of septic tank contents at a permitted wastewater treatment or permitted sewage disposal facility after cleaning of the structure(s) is completed.

M. Demolition

All structures that are to be demolished in lieu of cleaning should be carefully inspected for meth lab materials and hazardous materials. Normal demolition and disposal rules apply. In all cases a property owner is responsible for assessment, testing and proper removal and disposal of asbestos, lead, and mercury containing materials and other building materials in accordance with state and federal regulations, including the solid waste regulations in 401 KAR Chapters 47-48.

N. Burning a Meth-Contaminated Structure

Burning a meth-contaminated structure for fire service training in lieu of decontamination is strongly discouraged. Safety of firefighter entry into a former meth lab structure and effectiveness of decontamination of firefighter equipment cannot be assured. In all cases of a practice or training burn, the burn must be done in accordance with demolition and asbestos regulations. Approval must be obtained from the Kentucky Division for Air Quality prior to a training or practice burn.

VI. POST-DECONTAMINATION SAMPLING

A. General Sampling Issues

Post-decontamination samples must be taken after washing and sealing/painting of surfaces. As an option, the certified contractor may take wipe samples after washing of surfaces only if the decontamination standard has been achieved. However, the sealing/painting step helps to provide an additional layer of protection. Some studies have shown that elevated levels of meth may “wick” through the paint, but if the double washing is done, it is anticipated that the main meth mass will be removed before painting or sealing.

B. Sampling Protocols

Each room and space in the inhabitable property must be sampled. Procedures for meth wipe sampling are provided in Appendix C. **In all cases, a representative number of discrete samples should be biased and collected in the areas of suspected cooking, observed chemical spills,** or waste storage areas identified during the Preliminary Assessment of the inhabitable property. Table 3 lists the minimum number of composite samples that are required for post-decontamination sampling. All samples must be collected from cleaned surfaces and not new materials. If a wall or material identified below is removed and replaced as part of the

decontamination, the contractor can designate another location for sampling and document in the CCD.

Table 3
Post-Decontamination Sampling Protocols

Area	Sampling Protocol
Each Room	(4) ten cm x ten cm samples for total of 400 sq. cm consisting of : (1) sample from location at or near center of floor (1) sample from location at or near center of ceiling (1) sample from location at or near center of (2) walls (Samples can make up one (1) composite sample for each room) + the following samples
Kitchen	(4) ten cm x ten cm samples for total of 400 sq. cm consisting of: (1) sample from countertop (1) sample from stovetop (1) Range hood above stovetop (if present). If not present from a cabinet above the stovetop (1) Floor in front of the stovetop (Samples can make up one composite sample)
Bathroom(s)	(4) ten cm x ten cm samples for total of 400 sq. cm consisting of: (1) sample from countertop (1) sample from sink (1) sample from toilet (1) sample from shower or bathtub (Samples can make up one composite sample)
HVAC System	(4) ten cm x ten cm samples for total of 400 sq. cm at four (4) different locations in the ventilation system. Must sample cold air returns or plenums. (Samples can make up one composite sample)
Appliances (Cleaned)	One (1) ten cm x ten cm sample from exposed surface of each cleaned appliance. If multiple appliances are present, up to four (4) wipes can be combined into one composite sample representing 400 sq. cm.

All samples collected and analyzed must be below the decontamination standard of 0.1 µg/100cm². In addition to the samples noted in Table 3, the certified contractor must also collect quality assurance and quality control wipe samples and field blanks in accordance with standard sampling and analytical practices. The contractor must log all samples collected at the site and any QA/QC samples on a chain of custody form, maintain proper temperature and maintain records of sample shipment to the laboratory.

C. Analytical Laboratory Requirements

Certified contractors are required to use an EPA-accredited analytical laboratory to ensure that all analytical data are reliable and reproducible. For methamphetamine analyses, the laboratory must utilize Method 8270C-Modified, "Semi-volatile Organic Compounds by Liquid Chromatography or Gas Chromatography/Mass Spectroscopy", from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", U.S. EPA SW-846, Third Edition (Nov. 1986), Revision 3 (Dec. 1996), achieve a detection limit of at least 0.1 µg/ 100 cm², and include all quality assurance/quality control documentation required by the method. Laboratories that are approved to utilize other analytical methods for meth analysis must provide QA/QC documentation supporting the method to KDWM for review. For all other waste or chemical analyses requiring an off-site environmental laboratory, EPA SW-846 methods must be utilized. **It is the responsibility of the certified contractor to ensure that the laboratory used is an accredited laboratory and is capable of performing the required analyses.**

VII. EXTERIOR EVALUATION

A. Septic System Evaluation

Large volumes of meth lab wastes can pose a problem if they are flushed and end up in a septic system. It is believed that the micro-organisms present in the septic system can biologically break down many of the chemicals, however if a meth lab operated for a long period of time, under extreme pH conditions, it could cause damage to the operation of the system. If there is evidence that meth lab wastes may have been disposed into the septic system, field screening of the septic tank must be performed by the certified contractor. Evidence of waste disposal may include, but is not limited to: witness statements; stained or etched sinks, bathtubs, toilets; chemical odors coming from plumbing or septic tank; or visual observations of unusual conditions within the tank (dead tank); or stressed or dead vegetation in a drain field. Initial field screening should include monitoring the septic tank for VOCs using a PID or FID; and testing the pH of the liquid in the septic tank using pH paper or pH meter. Additional screening may be performed as necessary.

If field screening or other evidence indicates the septic system has been impacted with meth lab wastes, samples must be collected of the septic wastes in the tank for toxicity characteristic leaching procedure (TCLP) and other waste characterization parameters to determine if the wastes are hazardous, and arrangements will need to be made with an approved waste handling contractor and disposal facility to have the septic tank contents pumped out and properly disposed in accordance with state and federal regulations. Do not remove or dispose of the tank contents until proper testing has been done.

B. Evaluation of other Potential Releases

If evidence of a release of a hazardous substance related to meth lab activity is observed to the environment outside the inhabitable property, i.e., soil staining, spills, chemical containers with wastes or residues, evidence of burning or burying of meth wastes, suspected water well contamination, stream contamination, or similar condition, this must be documented in the CCD report submitted to the KDWM's Superfund Branch. All releases to the environment will need to be addressed in accordance with Kentucky statutes and regulations.

VIII. CERTIFICATE OF DECONTAMINATION

Once the certified contractor submits the *CCD*, KDWM will issue a *Certificate of Compliance (COC)* to the local health department. Please see Appendix B for the *CCD* report format. The health department will remove the posting of the Notice of Meth Contamination from the inhabitable property, which will allow the property to be re-occupied.

The certified contractor and property owner must retain all records of the decontamination activities for at least five (5) years following completion of the work. This provides valuable documentation of the cleanup for future property transfers. It is the responsibility of the property owner to comply with all real estate disclosure laws regarding environmental contamination on their property including meth labs and subsequent decontamination activities.

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References

Colorado Department of Public Health and Environment

www.cdphe.state.co.us/hm/methlab

Indiana Department of Environmental Management

www.idem/programs/land/drug_lab/#newrule

KCI, The Anti-Meth Site

www.kci.org/meth

Minnesota Department of Health

www.health.state.mn.us/divs/eh/meth

Missouri

www.dhss.state.mo.us/ResourceMaterial/meth

National Jewish Medical and Research Center

www.nationaljewish.org/news/meth

North Carolina

www.epi.state.nc.us/epi/oii/pdf/methguidelines

Tennessee Department of Environment and Conservation

www.state.tn.us/environment/dsf/meth

Washington State Department of Health

www.doh.wa.gov/dhp/ts/CDL.HTM

Glossary

Absorption: The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

Acidic: The condition of any media that contains a sufficient amount of acid substances to lower the pH below 7.0.

Acute Effect: An immediate response to a contaminant that may consist of shortness of breath, cough, chest pain, dizziness, lack of coordination, chemical irritation, and burns to the skin, eyes, mouth and nose, and in severe cases, death.

Acute Exposure: An exposure over a relatively short period of time (minutes, hours) that may result in health effects. An acute exposure to high levels of contaminants found in methamphetamine labs may cause acute effects, which can occur during or immediately after a drug bust, before the lab has been properly ventilated. Also, latent effects may occur following acute exposure.

Adverse Health Effect: A change in body functions or cell structure that might indicate or lead to disease or health problems.

Air Hose: Tubing used to transport air.

Ambient Air: Any unconfined portion of the atmosphere: open air, surrounding air.

Amphetamines: Amphetamines are stimulants or "uppers" – which can be manufactured in legal and illegal labs. Amphetamines stimulate the user's central nervous system with a sense of well-being and higher energy, resulting in social inhibitions and feelings of cleverness, competence and power. The term "amphetamine" refers to a large class of stimulants: amphetamines (black beauties, white bennies), dextroamphetamines (dexies, beans), and methamphetamines (crank, meth, crystal, speed). They can be taken orally, injected, smoked, or snorted. Chronic use can cause paranoia, picking at the skin, auditory and visual hallucinations, and extremely violent and erratic behavior. Amphetamines are highly addictive.

Anhydrous ammonia: A chemical extensively used as farm fertilizer but is also an ingredient in the production of meth, which can cause severe chemical burns on the skin.

Asbestos: Material used for fireproofing, electrical insulation, building materials, brake linings, and chemical filters; the material is used to insulate homes and it can be very dangerous to your health if disturbed.

Background Level: An average or expected amount of a substance in a specific environment, or typical amounts of substances that occur naturally in an environment.

Methamphetamine is not a naturally occurring substance and the background level in a residence should be zero if no manufacturing or smoking of the substance happened at the residence.

Chronic Exposure: Chronic exposure occurs over an extended period of time, such as months or years. A chronic health effect is one that usually appears after a lengthy period of time, possibly years. Not much is known about the chronic health effects from these labs. However, there is scientific evidence from animal and human toxicity studies that shows the chemicals used in the manufacture of this drug can cause a range of health effects. These include cancer, damage to the brain, liver and kidneys, birth defects, and reproductive problems, such as miscarriages.

Cleanup: Proper removal and/or containment of substances hazardous to humans and/or the environment at a chemical investigation site. Cleanup refers to two specific phases: **Removal** occurs when a meth lab is identified and seized by law enforcement, and bulk chemicals, equipment and wastes are removed and disposed of by a hazardous waste contractor. **Decontamination** refers to the cleaning, containment and disposal of residual contamination that exists at an **inhabitable property** after the bulk *removal* of chemicals and chemical wastes.

Concentration: Amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

Confined Space: As defined in 803 KAR 2:200, it is a space having the following characteristics:

- Limited means for exit and entry; and
- Ventilation of the space is lacking or inadequate, allowing for the potential accumulation of toxic air contaminants, flammable or explosive agents, and/or depletion of oxygen.

Contaminant: A substance that is either present in an environment where it does not belong or is present at levels that might cause adverse health effects.

Controlled Substance: A drug, substance, or immediate precursor in Schedule I.

Cook: A slang term for the process of manufacturing methamphetamine and other illegal substances or the person(s) responsible for manufacturing methamphetamine or other illegal substance.

Corrosive: A substance having the capability or tendency to deteriorate metals by oxidation or chemical action. Chemicals used in the manufacturing of methamphetamine may be corrosive in nature.

Curtilage: A legal term denoting the enclosed land surrounding a house or dwelling.

Decontamination: The removal or neutralizing of residues and chemicals from a clandestine drug lab. Decontamination may require some or all of the following steps: assessment, evaluation, testing, venting, detergent scrubbing, encapsulation, demolition, and proper disposal of wastes. In this guidance, there are two types of decontamination based on site conditions: 1) Limited Decontamination, and 2) Full Decontamination.

Drug Enforcement Agency (DEA).

Dermal Contact: Touching of/by the skin.

Encapsulation: Act of surrounding, protecting and/or sheathing a building material, by applying paint or other sealant. This process is part of the decontamination aspect of the cleanup.

EPA: United States Environmental Protection Agency (U.S. EPA).

Exposure: Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be acute or chronic.

Exposure Pathway: The route a substance takes from its source to the affected area, and how people can come into contact.

Flame Ionization Detector (FID) – One of several methods for detecting and quantifying primarily hydrocarbon gases. Flame ionization utilizes a hydrogen flame to ionize and detect gases that are essentially flammable; however the process is far less sensitive to oxygen containing compounds due to the reduced carbon atoms.

Flammable: Ability of a substance to easily ignite or burn rapidly.

Groundwater: Water beneath the earth's surface in the spaces between soil particles and between rock surfaces.

Hazard: A source of potential harm from past, current, or future exposures.

Hazardous Waste: Any discarded material or material intended to be discarded or substance or combination of such substances intended to be discarded, in any form which because of its quantity, concentration or physical, chemical or infectious characteristics may cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous Waste Operator (HAZWOPER) training: A 40-hour course required by OSHA under the General Site Worker standard per 803 KAR 2:403 and 29 CFR 1926.50 through 1926.66 for workers to enter and work within an area defined as a hazardous waste site or uncontrolled hazardous waste site. Certified contractors and their workers who are performing decontamination services are required to obtain this

training including the required field experience working under a supervisor prior to entering a lab, and to attend a “refresher” training annually.

(HVAC): Heating, ventilation and air conditioning system

(HEPA): High-efficiency Particulate Air Filtration System.

Hotel: As defined in KRS 219.011, it refers to every building or structure kept, used, maintained, advertised, or held out to the public as a place where sleeping accommodations are furnished to the public, and includes motels, tourist homes, and similar establishments, but excludes boarding houses and rooming houses.

Ingestion: The act of swallowing.

Inhabitable Property: Any building or structure and any related cartilage, water, water system, or sewer system used as a clandestine methamphetamine drug lab that is intended to be primarily occupied by people, including a mobile home, which may be sold, leased, or rented for any length of time. “Inhabitable property” shall not include a hotel, as defined in KRS 219.011.

Inhalation: The act of breathing.

Latent Health Effect: A disease or an injury that happens as a result of exposures that occurred in the past.

Methamphetamine (Meth): Methamphetamine is a member of the amphetamine family. It is highly addictive and is associated with more severe health effects than other amphetamines.

Neutralization: The act of rendering a substance neutral (pH = 7.0).

Non-porous: Material that does not contain holes or pores, usually a hard surface.

Non-volatile: Substances that do not readily evaporate at normal temperatures and/or pressures.

(OSHA): Occupational Safety and Health Agency

Owner: Any person, firm, or corporation who owns, in whole or in part, the land and/or structures such as buildings, motor vehicle, trailer, boat or other appliance at a clandestine drug lab site.

Parts per million (ppm): A unit of concentration of a measured substance, which is equal to 1 mg/L of water.

Personal Protection Equipment (PPE): Specific equipment used to protect the wearer from the hazards involved with the removal and decontamination of methamphetamine and other chemicals found at a clandestine drug lab/site.

pH Paper: Sampling device used to test acidity of a solution, powder or residue.

Photoionization detector (PID): A device used for the detection of certain VOCs, based on their ionization potential, which utilizes ultraviolet light to ionize gas molecules.

Population: A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

Porous: Material that contains holes or pores.

Precursor: A substance from which another substance is formed. In meth-related areas, precursors are any compounds or mixtures containing ephedrine or pseudoephedrine. Those two drugs are precursors to meth.

Private, residential property: Single family home, apartment or multiple family unit or dwelling.

Red phosphorus: Ingredient that can be used in the manufacture of meth; the strike plate on a book of matches is a frequently used source of red phosphorus.

Related hazardous material or hazardous waste: Any hazardous waste as defined in this chapter or hazardous material as defined in KRS 174.405 that is related to the clandestine production of methamphetamine.

Release: The spilling, leaking, or discharging of a hazardous substance into the air, soil or surface or ground water.

Remediation: See decontamination.

Removal: The act of elimination, transfer or withdrawal of a substance from a location.

Residues: Contamination that remains at a site after cleanup has been completed. Contaminants may be left behind at a site if the concentrations are too low to cause harm, or if it is not cost-effective to remove all of the contaminants and the risks are deemed minimal.

Respirator: A device designed to protect the wearer from inhalation of harmful atmospheres or air containing harmful chemicals and particulates. Respirators are required upon initial entrance into a clandestine drug lab.

Risk: The probability that something may cause injury or harm.

Route of Exposure: Way people come into contact with a hazardous substance. Three common routes of environmental exposure are inhalation, ingestion, or dermal contact.

Semi-volatile: Substances that slowly evaporate at normal temperatures and/or pressures.

Septic System: A small scale, typically private waste management system. Most often used for homes/facilities in rural areas, the system usually contains a settling tank and a drainfield, which may cause groundwater contamination if not working properly.

Solvent: A liquid capable of dissolving or dispersing another substance (for example, acetone, methanol or mineral spirits). Exposure to solvents can irritate the skin, mucous membranes, respiratory tract, and cause adverse effects on the central nervous system.

Source of Contamination: The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination may be the first part of an exposure pathway.

Sources of Airborne Particulates include dust, combustion products associated with motor vehicle or non-road engine exhausts, emissions from industrial processes, combustion products from the burning of wood and coal, and reactions of gases in the atmosphere.

Structure: A dwelling, building, or other constructed or pre-fabricated enclosure.

Non-occupied (Non-occupancy) Structure: A structure not intended for primary occupancy by people. These structures include but are not limited to detached garages, barns, pole barns, sheds, outbuildings, silos and chicken coops.

Occupied (Occupancy) Structure: A structure, where occupants inhabit for an indeterminate amount of time, as to where they would be exposed to substances. These structures include but are not limited to a residential structure, such as a house, apartment, or manufactured home and any structure on the property that has a similar potential for exposure including child playhouses, etc. Any structure that is attached to an occupancy structure such as an attached garage is considered part of that structure. Any structure that, in the future, might be converted to an occupancy structure should be cleaned as such.

Substance: A material of a particular kind or chemical constitution that is deemed harmful and usually subject to legal restriction.

Surface Material: Any porous or nonporous substance common to the interior of a building or structure, including but not limited to ceilings and walls, window coverings, floor and floor coverings, counters, furniture, heating and cooling duct work, and any other surface to which inhabitants of the building or structure may be exposed.

Surface Water: Water on the surface of the earth, such as in lakes, rivers, streams and ponds.

Surrogate: A substitute.

Toxic Agent: Chemical or physical (for example, radiation, heat, cold, microwaves) agents, which under certain circumstances of exposure, may cause adverse health effects to living organisms.

Vapor: The gaseous phase of a substance that is normally liquid or solid. Some hazardous substances can vaporize (become vapor) while in the soil or groundwater, filling air spaces in the soil or intruding into overlying buildings.

Ventilation: To circulate air, typically replacing stale or noxious air with fresh air. This is a required first step in the decontamination process.

Volatile: Evaporating readily at normal temperatures and pressures. Volatile substances can be readily vaporized.

Volatile Compounds (VOCs): Compounds that are in most cases organic in composition and evaporate readily into the air. VOCs include substances such as benzene and toluene, which can be used in the manufacturing of meth. Ammonia is also considered a volatile compound but is inorganic.

Appendices

**Appendix A Methamphetamine Manufacturing Processes and
Common Manufacturing Chemicals**

Appendix B *Contractor's Certificate of Decontamination*

Appendix C Sampling Protocols and Guidance

- C.1 Meth Wipe Sampling Procedure
- C.2 Vacuum Sampling to Determine Presence of Meth
- C.3 pH and VOC Sampling Procedures
- C.4 Indoor Sampling and Risk Decisions

Appendix A

Methamphetamine Manufacturing and Common Manufacturing Chemicals

In Kentucky, the majority of known meth labs have used the Anhydrous Ammonia also known as the Birch or Nazi method (See **Figure A, Methamphetamine Manufacturing Processes**). These labs are able to produce small quantities of meth in a short period of time, earning these operations the name "user labs". This process involves the extraction of ephedrine or pseudoephedrine from various pharmaceutical products with organic solvents. Once extracted, the ephedrine and/or pseudoephedrine is reduced using lithium or sodium metal in anhydrous ammonia to create methamphetamine base. Subsequent acidification with hydrochloric acid generates the desired methamphetamine-hydrochloride (HCl) product – a process referred to as "salting out".

Specific hazards presented by an anhydrous ammonia lab while cooking include flammability, irritation, toxicity, and oxygen deprivation created by the concentrated ammonia atmospheres. In addition, lithium and sodium metals are extremely corrosive and react violently with water resulting in a fire or explosion.

The other common method is the Red Phosphorous method (commonly called the "Red P" method). This production method also uses extracted ephedrine or pseudoephedrine as their chemical precursor. However in this method, the reduction of ephedrine/pseudoephedrine occurs through a series of chemical substitutions using hydriodic acid and red phosphorus. Due to the nature of this chemical process, the "Red P" method often generates more side products and impurities that increase the production hazards. Like the anhydrous ammonia method, the final methamphetamine-HCl collection step involves a "salting out" process with hydrogen chloride gas.

Specific hazards presented by a "Red P" lab while cooking include the production of phosphine gas which is flammable, explosive, and a respiratory tract irritant, the risk of red phosphorus converting to yellow (or white) phosphorus which can ignite spontaneously in moist air, and the acutely corrosive atmospheres due to the use of acids and sodium hydroxide.

Another meth cooking method that is not that common, but can be found is the Amalgam or P2P method, which primarily uses phenyl-2-propanone (P2P) and methylamine along with lead acetate and mercuric chloride. Other chemicals used in this method include aluminum, hydrochloric acid, isopropyl alcohol, methanol, ethanol, acetone, benzene, chloroform and ether. Elevated levels of lead and mercury can be present following this type of lab.

The "cooking" of meth can involve a large variety of chemical reagents depending on the specific method of manufacture. In general, the process involves precursor reagents, organic solvents, and reactive reagents that facilitate the conversion of the precursor into meth. The chemicals used are typically purchased, stolen, or illegally manufactured. Even though many of these chemicals are commonly found in households and can be "safe" if used appropriately, their inherent dangers are exacerbated when used inappropriately or in combination with other chemicals during the meth production process. Improper storage and disposal of these chemicals and mixtures also creates hazards.

Exposures and health concerns are greatest during the cooking processes. The levels of airborne chemicals vary greatly with the different cooking methods, the specific chemicals used, and the scale of the production, the size of the room or structure, and the ventilation of the cooking area. General concerns include the risk of fires or explosions due to usage of

flammable solvents, respiratory difficulties from breathing toxic or corrosive vapors, and skin irritations from strongly acidic and basic solutions. Chronic exposure to meth production may cause long-term health problems. Drug paraphernalia such as needles present possible exposure to infectious agents such as HIV and Hepatitis B and other blood-borne pathogens.

After the cooking process has stopped, most of the hazards decrease. In addition, proper removal of the production wastes and bulk chemical supplies eliminates many of the risks associated with clandestine meth labs. Volatile chemicals and solvents such as ammonia, methanol, ether, or acetone will move into air and will be readily removed from the structure by ventilation.

However, some residual contamination created from repeated "cooks" can persist long after all production has ceased. Semi- or non-volatile production chemicals such as acids, bases, and other corrosives, precursor chemicals, and products used or created in the manufacturing processes are more persistent. These residual chemicals can be volatilized or aerosolized during the cooking process and deposit on surfaces and in materials (such as carpeting, fabrics, and building structure materials). Meth can be found on most surfaces, building materials, and home furnishings of a clandestine lab.

Research done by National Jewish Hospital suggest that re-volatilization of meth may occur after the initial deposition. Meth and other fine particle contaminants can be aerosolized and dispersed throughout the former lab.

Refer to **Table A, Meth Production Chemicals Present in Active and Former Meth Labs** (below) for comparison of active meth lab dangers to residual contaminants remaining after meth production ceases.

Regarding **Table A**:

- The former meth lab environment is much less hazardous than the active lab environment. As indicated in the last column, the solvents have dissipated and the reactive materials have been mostly reduced or depleted; existence of either is far less in the former meth lab than in an active meth lab.
- Not all the chemicals listed in Table A will be found in every meth lab. Reaction materials used depend upon the method of production. The solvent(s) used in each cooking process may vary due to availability, cook's preference, etc.

Table A. Meth Production Chemicals Present in Active and Former Meth Labs

	<u>Chemical</u>	<u>Common Sources</u>	<u>Properties of Chemicals in Active Meth Labs</u>	<u>Presence of Residual Contamination in Former Meth Lab</u>
Precursor Reagents	Pseudoephedrine	Cold Medicine	Irritant, stimulant	Yes
	Ephedrine	Cold Medicine	Irritant, stimulant	Yes
Extraction / Reaction Solvents	Acetone	Fingernail polish remover	Volatile irritant, flammable	No
	Benzene	Thinners, lacquers	Volatile irritant, flammable	No
	Ethanol	Grain alcohol	Volatile irritant, flammable	No
	Ether	Starter fluid	Volatile irritant, flammable	No
	Freon	Refrigerant	Volatile irritant	No
	Hexane	Thinners, lacquers	Volatile irritant, flammable	No
	Isopropanol	Rubbing alcohol	Volatile irritant, flammable	No
	Methanol	Gasoline additives, Heet	Volatile irritant, flammable	No
	Petroleum Distillates	Mineral Salts	Volatile irritant, flammable	No
	Toluene	Toluol	Volatile irritant, flammable	No
	Trichloroethane	Gun cleaning solvent	Volatile irritant	No
Reaction Materials	Sodium Hydroxide	Lye, Drain cleaner	Corrosive	Yes
	Hydrochloric Acid	Muriatic Acid, Concrete cleaner	Corrosive	Yes
	Sulfuric Acid	Battery Acid Drain cleaner	Corrosive	Yes
	Red P Method Specific			
	Iodine	Antiseptic, Tincture of Iodine	Inhalation irritant	Staining
	Red Phosphorus	Matchbook strikers, flares	Flammable and explosive	No
	Hydriodic Acid			Yes
	Anhydrous Ammonia Method Specific			
	Anhydrous Ammonia	Fertilizer	Corrosive	No
	Lithium Metal	Lithium batteries	Corrosive, Explosive with H ₂ O	No
	Sodium Metal		Corrosive, Explosive with H ₂ O	No
Production Side Products and Contaminants	Solid Waste		Misc. health hazards	No
	Solvent Mixtures		Volatile irritant, flammable	No
	Red P Method Specific			
	Phosphine Gas		Toxic gas, Explosive with air	No
	Phosphorous Acid		Irritant	Yes
	Iodine Vapor		Inhalation irritant	Staining
	Hydriodic Acid		Corrosive	Yes
	Anhydrous Ammonia Method Specific			
	Ammonia Vapor		Corrosive	No
	Lithium Hydroxide		Corrosive	Yes
	Sodium Hydroxide		Corrosive	Yes

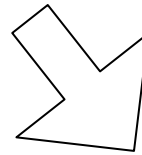
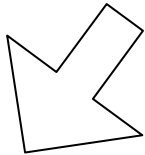
Figure A: Methamphetamine Manufacturing Processes

Extracting Precursor Drug:

Use: Cold tablets, solvents and coffee filters

Wastes: Solvent vapors, ephedrine or pseudoephedrine, binder from tablets, and coffee filters.

Solvent evaporates or may be reused.



Red Phosphorus (Red P) Method

Use: Iodine, red phosphorus, filters, **heat**, sodium hydroxide, and ether or other solvent (e.g., hexane, toluene).

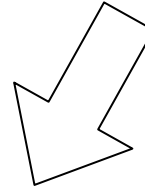
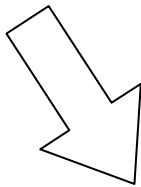
Wastes: Iodine, red phosphorus, sodium hydroxide, coffee filters, and solvent gases and possible other by-products. solvent vapors, iodine sublimation

Anhydrous Ammonia (Nazi) Method

Use: Sodium, potassium, or lithium metal, anhydrous ammonia, water, ether or other solvent.

(**Heat** may be used to expedite solvent evaporation. Exothermic reaction can cause gaseous by-products)

Wastes: Coffee filters, excess metal.



“Salting Out”

Use: Rock salt or table salt, sulfuric or muriatic acid, filters.

Wastes: Excess salt, sulfuric or muriatic acid, hydrochloric acid, hydrogen chloride gas, coffee filters, meth, solvent from above phases, possibly acetone.

Appendix B:

Contractor's Certificate of Decontamination For Inhabitable Properties (CCD)

Please contact KDWM for an electronic version

I. Property and Contact Information

Property Location:

Property Street Address: _____

Nearest City/Town and Zip Code: _____

County: _____ Latitude: _____ Longitude: _____

Date of Lab Discovery: _____

Property Owner:

Name (s): _____

Mailing Address: _____

City, State, Zip Code: _____

Telephone # _____ Cell phone # _____

E-Mail Address: _____

Certified Contractor:

Contractor Name: _____

Contact Person: _____

Mailing Address: _____

City, State, Zip Code: _____

Telephone # _____ Cell phone # _____

Fax No. _____

E-Mail Address: _____

II. Decontamination Procedures Completed

Note: Please contact KDWM for an electronic version of the CCD. A detailed description of specific decontamination procedures completed in each room of the inhabitable property must be included below. Please attach extra sheets to provide details and include a Site Map drawn to scale depicting the property and its layout including identification of other structures on the property, its location relative to streets and surrounding properties, drainageways, and other surface features. Sketches of each room and each floor of the property must also be completed and attached depicting the areas of observed contamination, location of appliances, fixtures, and locations of post-decontamination samples. Photographs must be taken of before and after decontamination conditions and of all post-decontamination sample locations in order to provide documentation of the cleanup, and copies must be provided as part of this report.

Date Preliminary Assessment Conducted: _____

Type of Decontamination Completed (Limited or Full) Provide Justification. _____

Date HVAC system disconnected: _____

Date ventilation with fans initiated: _____

Date air monitoring conducted: _____

Date decontamination activities initiated: _____

Type of Personal Protective Equipment used: _____

HVAC System

Remove and replace all HVAC filters _____

Remove and clean diffusers and intakes and areas around them _____

Remove all debris and thoroughly clean the entire HVAC system including ductwork _____

Chemical Wastes/Spills

Were any meth wastes (containers, syringes, etc.) found? Types? Contact KSP or law enforcement: _____

Neutralize chemical spills that are found: _____

Absorb chemical spills and containerize waste for proper disposal: _____

Porous Items Cleaning/Disposal

Remove and render unusable all soft, porous materials including the following:

- Clothing _____
- Carpeting _____
- Upholstered furniture _____
- Draperies _____
- Other/Miscellaneous (stuffed animals, toys, mattresses, etc. _____)

List items commercially cleaned: _____

Structural Features and Surfaces

Segregate each room that is being decontaminated with plastic sheeting _____

Remove and replace any stained semi-porous building materials (drywall, plaster, and paneling) that cannot be cleaned

Double-wash walls, floors, ceilings, countertops with hot water and detergent (list type of detergent used) _____

Remove and dispose of suspended or attached acoustic ceiling tiles _____

Seal "popcorn" ceilings in lieu of testing _____

Floor coverings (Describe whether removed, cleaned, sealed, or covered in place)

List any appliances that were removed and disposed _____

List any appliances that were cleaned and will be reused _____

Encapsulation

Paint or seal walls, ceilings, floors and woodwork with paint or polyurethane following cleaning _____

Plumbing

Flush attached plumbing: _____

Check all drain traps with PID for volatile compounds and take pH readings for corrosives.

Remove etched or stained plumbing fixtures: _____

Garages, Outbuildings and Non-Occupancy Structures

Inspect all non-occupancy structures and follow decontamination steps if needed _____

Waste Disposal

All wastes from the decontamination were rendered unusable, and were properly characterized and disposed (attach disposal receipts).

Post-Decontamination Sampling

Documentation of post-decontamination samples collected. Must provide maps showing sample locations and attach copies of laboratory analytical results for each room, including chains-of-custody and QA/QC data. Verify correct lab method used.

Exterior Evaluation

Check septic system for volatile compounds and pH to determine if meth lab wastes have been disposed (Document field screening results)

Were samples collected of the wastes in the septic tank? Include copies of results. ____

Were the septic tank contents removed and disposed? Include disposal receipts. ____

Are other releases present that may require additional investigation? _____

III. Certification Statements

Contractor Certification:

I certify that all information described in this report is true and correct, to the best of my knowledge, and that the assessment and decontamination activities conducted at this property meet the decontamination standard and is in compliance with KRS 224.01-410 (3) and *the Kentucky Methamphetamine Lab Decontamination Guidance for Inhabitable Properties, November 2007*.

I further certify that the decontamination activities were performed safely and in accordance with 803 KAR 2:403 and 29 CFR 1926.50 through 1926.66.

Print Name of Contractor _____

Signature of Responsible Official _____

Date _____

Property Owner Certification:

I certify that I own or have legal authority for this property. I have received this report prepared by a certified contractor and understand that I must continue to comply with KRS 224.01-410 and all other state and federal laws. I further certify that the information in this report is true and correct, to the best of my knowledge.

Print Name of Owner _____

Signature of Owner _____

Date _____

Appendix C.1: Methamphetamine Surface Wipe Sampling Procedure

Wipe Sampling: Short Version

- Use one 3" x 3" general use sterile gauze pad (sampling wipe) per sample.
- Wear a new pair of nitrile gloves for each sampling.
- Wet the individual gauze wipe with 2 mL of methanol just before sampling.
- Wipe in a concentric square pattern within a measured 10 cm by 10 cm area.
- Because methanol will evaporate to dryness, lessening the ability to pickup meth, wipe sample the area within 5 seconds.
- Place the wipe back into the Teflon-lined jar and close the lid immediately after wiping.

Wipe sampling is performed to establish the presence of meth on non-porous surfaces. Samples should be taken using methanol-dampened wipes. Wipe material can be sterile filters, gauze pads or swabs and can be obtained pre-prepared from an environmental laboratory.

Water-dampened wipes are not approved by this guidance due to the lack of meth capture by water-dampened samples. The sampler should have clean hands and must wear gloves during each sampling event to prevent the introduction of contamination or cross contaminating sample areas. The sampling area should be a relatively dry surface. Post-decontamination wipe sampling should be performed after washing and painting or sealing of walls and surfaces.

Procedure includes:

1. Sampler dons a clean pair of latex or other chemically-protective gloves.
2. Sampler attaches 10 centimeter (cm) by 10 cm template or measures with a ruler and marks by using tape a pre-designated sampling location or area. (Sampler should avoid touching the area within tape/template as to not disturb sampling area.) The sampler can either mark one sample at a time, or mark off all areas to be sampled within the structure at once. Photograph sample sites with an identifying reference point.
3. Sampler dons a clean pair of gloves to begin sampling.
4. Either soak the sampling wipe (filter or gauze pad) with 2 mL methanol or take the wipe out of a pre-soaked container. Use dampened wipe within 5 seconds of applying methanol to ensure that the wipe is damp. A dry wipe will not capture a representative meth sample.
5. Applying firm pressure, wipe the surface area within the template/taped area by starting at the outside edge working towards the center of the surface area by wiping in concentric squares of decreasing size until the area inside the template has been wiped. Avoid wiping the marking tape or template. Fold the wipe so the sampled side is folded in.
6. Insert the wipe into the sample jar and close the lid tightly.
7. Record the exact location, including the room and the approximate height (from the floor), date and time of the sample on the sample container, the chain of custody form and sampling notebook.
8. Properly dispose of gloves and marking tape and proceed to the next sampling location.

Appendix C.2:

Vacuum Sampling to Determine Presence of Methamphetamine (Optional)

Contaminant of Concern: Methamphetamine
Typical Sample Materials: Carpet, drapes, textured upholstered furniture, porous stone (brick or cinderblock), raw wood, or any surface with accumulated dust particles.

Equipment needed:

- Area sampling pumps capable of at least 20 L/min flow rate (e. g., SKC Carpet Sampling Pump Kit).
- 37 mm cassettes equipped with glass fiber filters and backup pads.
- Flexible tubing to connect the pump to the filter cassettes.
- Small piece of tubing (1 to 2 in.) with one end cut at a 45-degree angle to be used as the "vacuum nozzle".
- Primary flow meter (e. g., SKC DC-Lite) for pump calibration.
- Field rotameter for convenient calibration checks.

General Method:

Pumps should be calibrated to approximately 20 L/min (with exact calibration flow rate recorded) before the sampling project begins. Confirmation of the calibration can be periodically checked between samples and must be confirmed at the end of the sampling project. The calibration should be performed while the tubing and type of filter cassette to be used during sampling are attached to the pump. If desired, an in-line field rotameter can be used throughout the sampling process to monitor the flow rate.

The sampling area should be measured and delineated (typically 4" x 4," or 6" x 6"). In general, visibly soiled, dusty, or heavily used areas are good choices for sampling. Perform a minimum of two passes at right angles to each other while sampling for one minute. During the sampling of softer materials, press the angled tubing nozzle firmly onto the sampling surface to agitate particles.

Avoid plugging the nozzle of the tubing as this restricts the flow and could damage the pump. Typical causes of plugging are pressing the nozzle too firmly into the sample without sufficient movement (causing a seal between the surface and the nozzle) and sucking up large, loose particles that either block the nozzle opening or buildup at the inlet to the filter cartridge.

Immediately after an individual sample has been collected, the pump should be turned off such that no extraneous material will be collected. The filter cassette should be disconnected, sealed, and labeled to prepare for transport back to the lab where chemical analysis can be completed. After all sampling has been completed, the pump exterior should be decontaminated (e.g., wiped with a 10% bleach solution). The short angled nozzle piece should be discarded. Inspect the collection hose between the filter and pump and discard if visibly contaminated.

Appendix C.3: pH and VOC Sampling Procedures

A. pH Testing Procedures:

Surface pH measurements shall be made using deionized water and pH test strips with a visual indication for a pH between 6 and 8. The pH reading shall be recorded for each sample location.

- For **horizontal surfaces**, deionized water shall be applied to the surface and allowed to stand for at least three minutes. The pH test strip shall then be placed in the water for a minimum of 30 seconds and read.
- For **vertical surfaces**, a Whatman 40 ashless filter paper or equivalent filter paper shall be wetted with deionized water and wiped over a 10 cm x 10 cm area at least five times in two perpendicular directions. The filter paper shall then be placed into a clean sample container and covered with deionized water. The filter and water shall stand for at least three minutes prior to testing. The pH test strip shall then be placed in the water for a minimum of 30 seconds and read.

pH testing shall be conducted on **at least three locations in each room** within the areas with visible contamination and within areas known to store or handle chemicals used for the clandestine drug laboratory in the residually contaminated portion of the real property.

B. VOC sampling and testing procedures:

A properly calibrated photoionization detector (PID) or flame ionization detector (FID) capable of detecting volatile organic carbons (VOCs) shall be used for testing.

- The **background concentration** of VOCs shall be obtained by testing three exterior areas outside the limits of the residually contaminated portion of the real property and in areas with no known or suspected sources of VOCs. All VOC readings shall be recorded for each sample location.
- **At least three locations in each room** of the residually contaminated portion of the real property shall be tested for VOC readings. The testing equipment probe shall be held in the sample location for at least 30 seconds to obtain a reading

All accessible **plumbing traps** shall be tested for VOCs by holding the testing equipment probe in the plumbing pipe above the trap for at least 60 seconds.

Note: Due to other potential sources of organic vapors in the home from common household cleaners or building materials, it may be difficult to determine definitively whether any positive readings with a PID or FID are a result of residual vapors of solvents from the meth lab cooking.